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(54) Plastics trim strips

(57) A trim strip of plastics material has a first component 21 comprising a flexible thermoplastic resin and a second reinforcing component 22 integral with the first component and comprising a relatively rigid thermoplastic resin. A permanent curve, which shows no wrinkles or distortion, is formed in a section of the strip by heating the strip until both components are pliable, stretching the heated section round a forming jig, maintaining the section under tension round the jig until the section has cooled to a non-pliable state, and removing the cooled curved section from the jig.

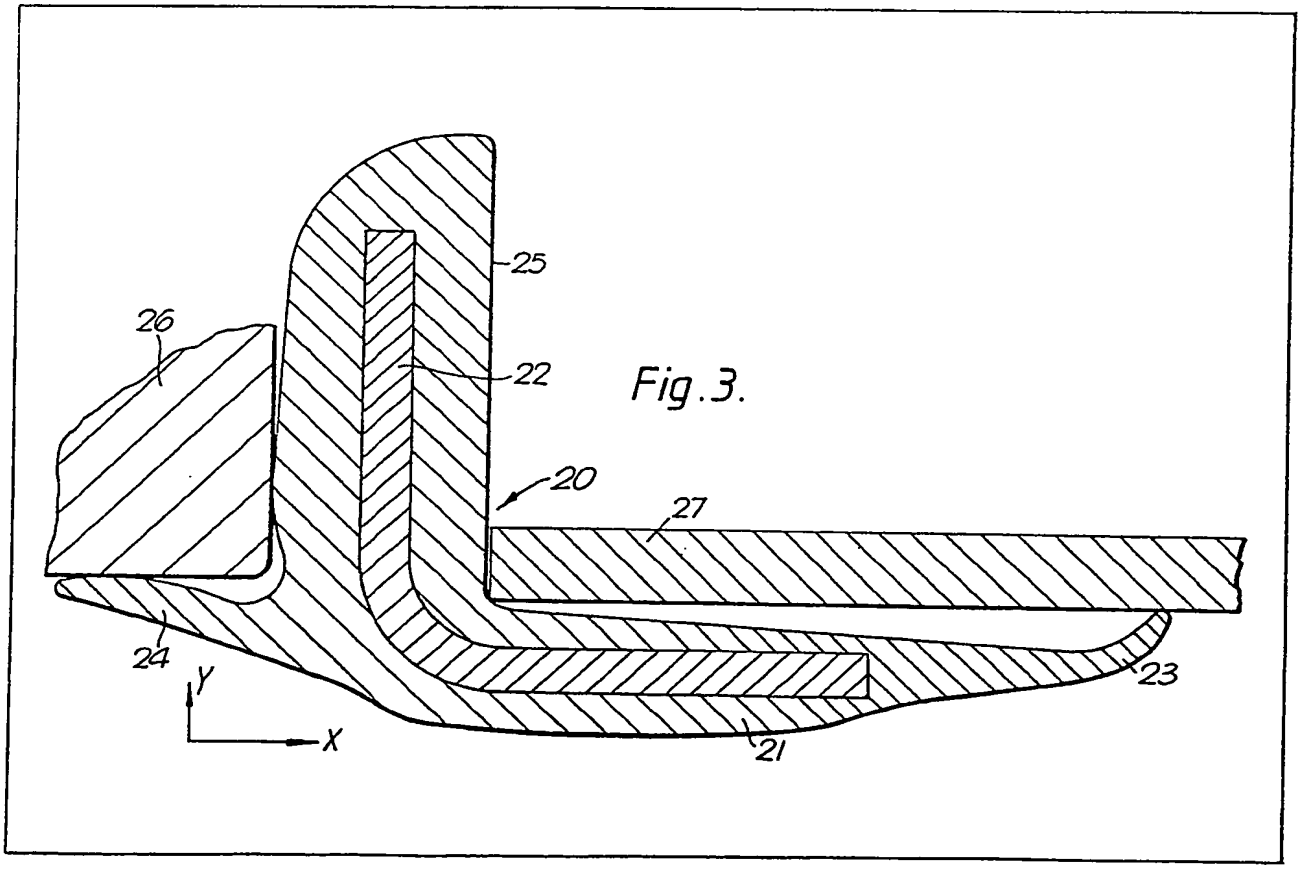

Fig.3.

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The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

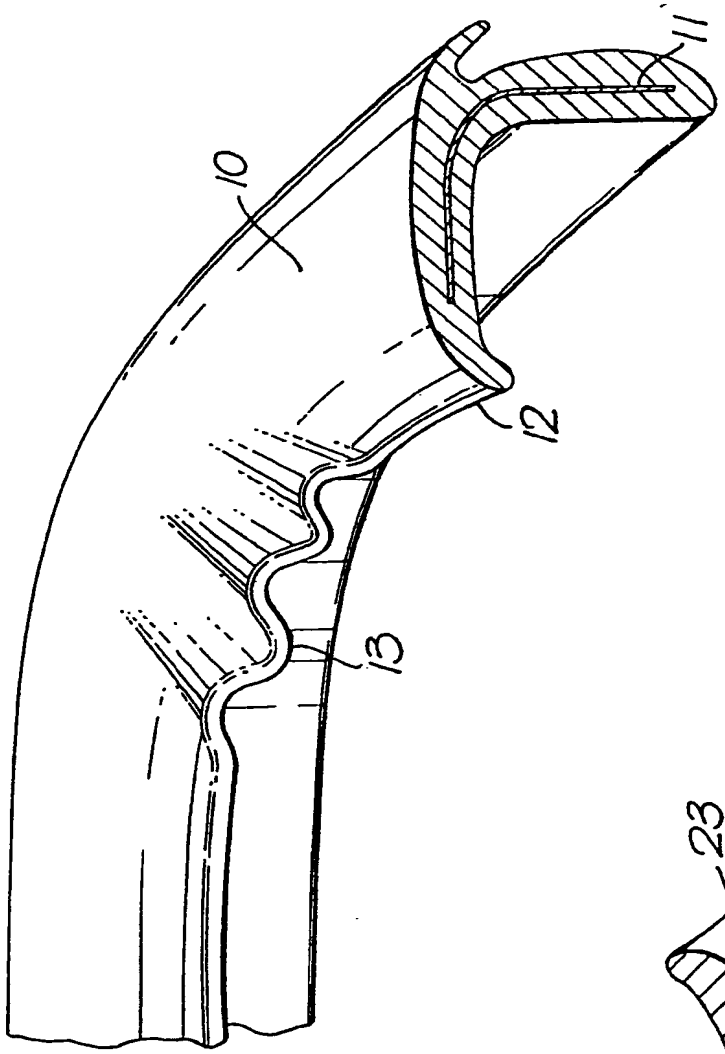

Fig.1.

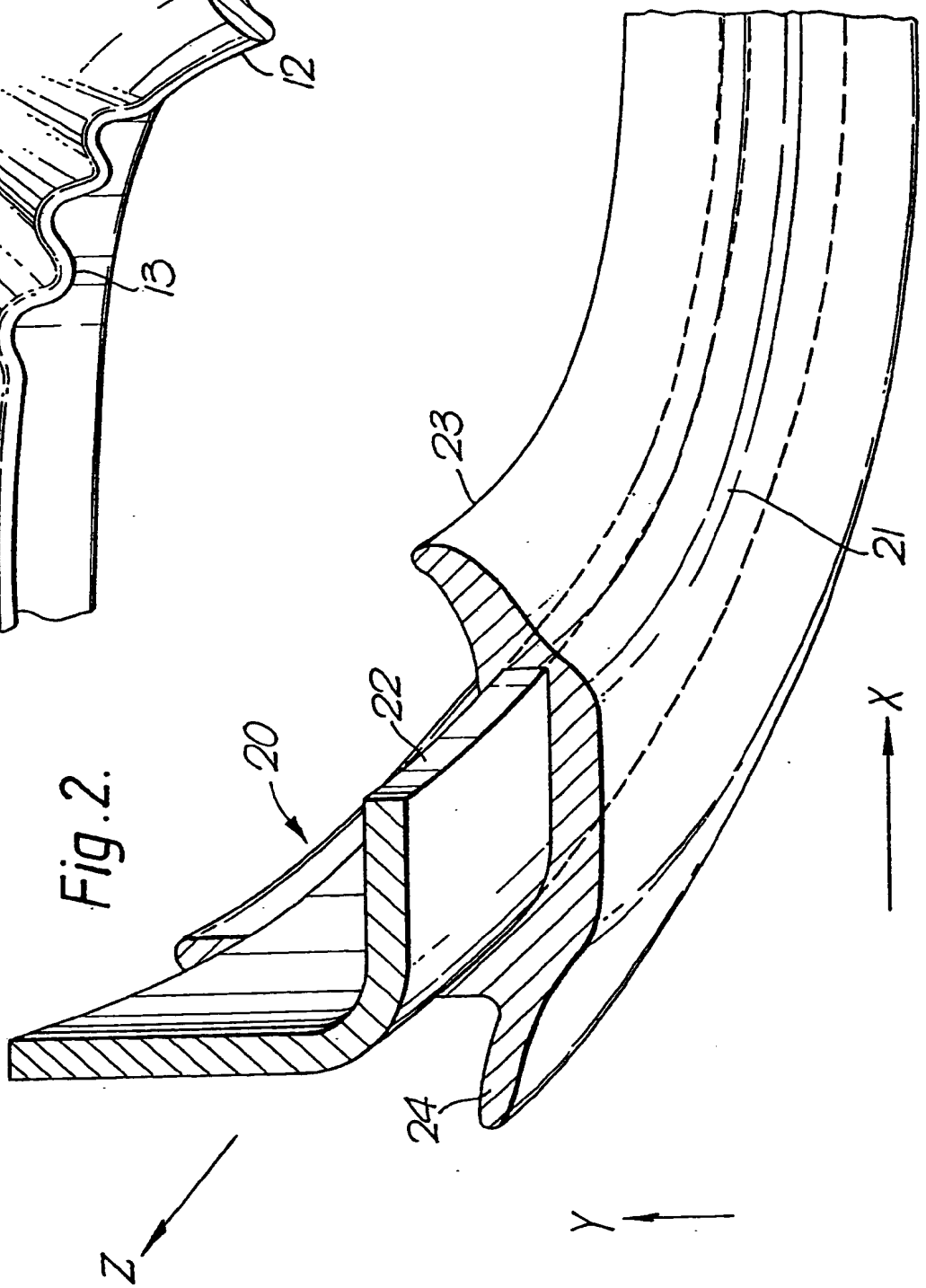

Fig.2.

Fig. 4.

Fig. 3.

SPECIFICATION

Improvements in or relating to trim strips or moulding structures

This invention concerns improvements in and relating to trim strips or moulding structures. In particular, the invention concerns reinforced flexible plastics extrusions suitable for use as decorative strips, trim strips, or as sealing strips for automobile windows, windscreens, domestic glazing, double glazing, replacement windows, and the like.

Trim or sealing strips are known in a variety of cross-sectional shapes, such as essentially rectangular, triangular, semi-circular, or L-shaped. For the sake of convenience, the following geometrical planes will be defined:—

The Z-plane is the plane perpendicular to the longitudinal axis of the strip. The Z-plane normally defines a transverse section of the strip.

The X- and Y-planes are planes perpendicular to the Z-plane and to each other. The X-plane will further be defined as containing a laterally extending face of the strip.

A disadvantage of a flexible reinforced plastics trim or sealing strip is that if it is bent through a large angle (e.g. 90°) in the X-plane then the plastics material on the inside of the bend may become wrinkled or distorted, whilst that on the outside of the bend may become unduly stretched. An example of this is shown in Figure 1 which is a perspective view of a windscreen sealing strip 10 made of polyvinyl chloride and having an integral reinforcing insert 11 made of aluminum strip. The strip 10 is bent through 90° in the X-plane and it will be seen that the inner edge 12 of the polyvinyl chloride strip is wrinkled (13). These wrinkles are not only unsightly but adversely affect the sealing properties of the strip. It is an object of the present invention to overcome this disadvantage.

According to a first aspect of the present invention there is provided a reinforced strip of plastics material, suitable for use as trim strip, weather strip, sealing strip, or the like, the strip being composed of a first flexible synthetic resin and incorporating an integral reinforcing strip member composed of a second synthetic resin substantially more rigid than the first resin.

According to a second aspect of the present invention there is provided a method of forming a permanent curve in a reinforced strip of plastics material, comprising the steps of,

(i) forming a strip of a flexible thermoplastic resin, the strip incorporating an integral reinforcing strip member of a thermoplastic resin substantially more rigid than the flexible theremoplastic resin,

(ii) heating a section of the strip until that section is pliable,

(iii) stretching the section whilst pliable round a curved forming jig,

(iv) maintaining th section under tension round th forming jig until the section has cooled to a non-pliable state, and,

(v) removing the cooled curved section from the jig.

It is found that when a strip according to the invention is heated and form d, the rigid reinforcement will stretch and, on cooling, will hold the softer, more flexible parts of the strip in the required set form. The softer parts, if appropriately shaped, may provide flexible lips on the edges of the strip for sealing against surfaces such as windows or windscreens.

The invention will now be described by way of example only with reference to Figures 2—4 of the accompanying drawings, in which,

Figure 2 is a perspective view of a partially cut-away trim or sealing strip according to the invention,

Figure 3 is a cross-section in the Z-plane through the strip of Figure 2, and,

Figure 4 is a schematic diagram of the method of the invention.

Referring to Figures 2 and 3 there is shown in Figure 3 a sealing strip 20 generally L-shaped in cross-section. The strip comprises outer and inner co-extruded components 21, 22 respectively. The outer component 21 consists of 75° Shore hardness flexible polyvinyl chloride (PVC), and the inner component 22 consists of a much harder rigid PVC as reinforcement. The inner component 22, as illustrated, is a true L-shape. The outer component 21 is provided, in the X-plane, with a flexible lip 23 in one direction to provide sealing abutment against a surface such as window glass and, in the opposite direction, with a web 24 for retaining abutment against, for example, a window frame or automobile body 26. The remaining part 25 of the outer component 21 is thicker than lip 23 or web 24 and extends in the Y-plane to provide abutment means for an edge of a sheet of glass 27 or other material. Lip 23 and/or web 24 can alternatively be formed from softer materials than outer component 21.

In Figure 2 the strip 20 is shown curved in the X-plane, as it will be when the strip bends or curves round the corner of an automobile window or windscreen, so that the leading edge of the lip 23 follows a concave path and the edge of the web 24 follows a convex path relative to the body of the strip.

In Figure 4 at 41 rigid PVC and 75° Shore hardness flexible PVC are co-extruded to form a length of strip as shown in Figures 2 and 3, comprising an outer component of flexible PVC enclosing an inner component of rigid PVC. At 42, a section of the strip which is intended to fit into a corner of a windscreen, is heated to 150—180°C until the section is pliable. At 43, the heated section is stretched round a curved forming jig (not shown) in the X-plane, as disclosed above; and, at 44, is maintain d in tension round the forming jig until th section has b en cooled by air or water to ambient temperature and has lost its pliability. At 45 the cooled formed section is removed from th jig, and is found to have a permanent curvature or bend where it was heated and stretched.

The hard reinforcement is found to hold the softer parts of the strip in the form set by the jig,

and it is found that there is practically no wrinkling of the inner edge of the curbed section.

Rigid thermoplastic resins other than rigid PVC may be used for the reinforcing member, such as noryl, high density polyethylene, ABS resin, polystyrene, polypropylene, or polycarbonate. The remainder of the strip may be co-extruded from softer thermoplastic resins such as PVC, EVA or low density polyethylene, as long as that softer thermoplastic resin is less rigid than the resin of the reinforcement.

The strip may include more than one flexible material in order to provide extra flexibility at the strip edge.

Thermoplastic resins in the context of this invention will be understood to include thermoplastic elastomeric compounds.

The principle of the invention may be applied to moulding structures other than sealing strips, such as trim strip or other decorative strip.

CLAIMS

1. A reinforced strip of plastics material, suitable for use as trim strip, weather strip, sealing strip, or the like, the strip being composed of a first flexible synthetic resin and incorporating an integral reinforcing strip member composed of a second synthetic resin substantially more rigid than the first resin.

2. A strip as claimed in claim 1 wherein the strip member is a co-extrusion with the remainder of the strip.

3. A strip as claimed in claim 1 or 2 wherein the resins are thermoplastic resins.

4. A strip as claimed in any preceding claim wherein a portion of the strip is a flexible lip composed of the first resin.

5. A strip as claimed in any preceding claim wherein the first resin is selected from the group comprising flexible PVC, EVA, and low density polyethylene, and the second resin is selected from the group comprising rigid PVC, noryl, high density polyethylene, ABS resin, polystyrene, polypropylene, and polycarbonate.

6. A strip as claimed in claim 5 wherein the first resin is PVC of Shore hardness substantially 75°.

7. A method of forming a permanent curve in a reinforced strip of plastics material, comprising the steps of,

(i) forming a strip of a flexible thermoplastic resin, the strip incorporating an integral reinforcing strip member of a thermoplastic resin substantially more rigid than the flexible thermoplastic resin,

(ii) heating a section of the strip until that section is pliable,

(iii) stretching the section whilst pliable round a curved forming jig,

(iv) maintaining the section under tension round the forming jig until the section has cooled to a non-pliable state, and,

(v) removing the cooled curved section from the jig.

8. A reinforced strip of plastics material, suitable for use as trim strip, sealing strip, or the like, substantially as herein described with reference to Figures 2 and 3 of the accompanying drawings.

9. A method of forming a permanent curve in a reinforced strip of plastics material, substantially as herein described with reference to Figure 4 of the accompanying drawings.

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